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FORMERLY WILLOW RUN LABORATORIES, THE UNIVERSITY OF MICHIGAN

P. O. BOX 618 • ANN ARBOR • MICHIGAN • 48107

PHONE (313) 483-0500

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A Skylab Program for the
International Hydrological Decade (IHD)

Quarterly Report for Period December 1973 - February 1974

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NASA Contract NAS9-13275

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Prepared by

Thomas W. Wagner - Co-investigator

NASA Technical Monitor

Mr. Larry York/TF
National Aeronautics and Space Administration
Johnson Space Center
Principal Investigator Management Office
Houston, Texas 77058

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A Skylab Program for the International Hydrological Decade (IHD)

Quarterly Report for Period December 1973 - February 1974

This report describes the progress during the fourth quarter (December 1973 - February 1974) of Contract NAS9-13275, "A Skylab Program for the International Hydrological Decade (IHD)," EREP No. 427. The principal objective of this program is to apply Skylab earth resources data to the study of the hydrology of a large lake system -- the Lake Ontario Basin. This program is being directed by Mr. F. C. Polcyn, under the general supervision of Mr. R. R. Legault, of the Environmental Research Institute of Michigan. Co-investigators include scientists at the University of Guelph and the Ontario Ministry of the Environment.

ACTIVITY

During this reporting period negative and positive transparencies of EREP photography (S190A and S190B) of the northern Lake Ontario Basin were received. These data were collected from SL3, Pass 29, Track 1, on September 9, 1973. Six-inch positive prints were made of two frames of S190A multispectral photography (6-bands), and selected portions of the high resolution pan-photography S190B, were also enlarged and printed. Several false color diazo-chrome images using different color-combinations of the S190A black-and-white multispectral photography were prepared in an effort to enhance visual interpretation of subtle terrain and water features. Thirty-five millimeter slides of these and other satellite images were used to illustrate a paper entitled "Skylab Data and Water Resources Management" by F. C. Polcyn and T. W. Wagner. This paper was presented on February 28, 1974 at the Skylab Science Experiments session of the 140th Meeting of the American Association for the Advancement of Science.

The quality of the multispectral and high-resolution photography for the northern Lake Ontario Basin is good to excellent -- with some clouds obscuring portions of three S190A frames collected over the Ottawa-Montreal area (outside the Basin). These S190A photographs have proved very useful in evaluating results of computer-processed ERTS data, collected from the same areas a year before. Regional trends of geomorphic provinces having differing hydrologic characteristics are identifiable from their patterns of natural and cultivated vegetation and surface water bodies. On a smaller scale, drainage and land use patterns associated with single watersheds which drain into Lake Ontario are clearly seen from the S190B high-resolution photography. Unfortunately, this photography did not include urban areas in and around the City of Toronto, but good coverage of several representative basin areas along the north shore of Lake Ontario was obtained. Analysis and application of this photography for hydrology is continuing.



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As excellent as this photography is, we are most anxious to obtain computer-compatible tapes of the multispectral scanner data for this Skylab pass. In part, we regard the usefulness of orbital data to terrestrial hydrology to be based on its ability to provide quantitative information for large areas. Machine processing of Skylab scanner data will hopefully provide numbers which may be applied to predictive models of the hydrologic processes within basins. Primarily in this way the Skylab and other orbital earth resources data will be optimum for supplying synoptic information required for management of our fresh water resources.

FUTURE PLANS

Generally a low level of effort will maintain this program until computer-compatible tapes of the multispectral scanner data (S192) become available. Processing experience and procedures currently being developed under other Skylab programs will be applied to this hydrology program. Some continuing analysis and dissemination to co-investigators of the photographic data will also take place during the next reporting period.

SPECIAL PROBLEMS

None

SIGNIFICANT RESULTS

None

PUBLICATIONS

"Skylab Data and Water Resources Management", by F. C. Polcyn and T. W. Wagner.

Respectfully submitted,

Fabian C. Polcyn
Principal Investigator

Approved by:

R. R. Legault
Director Infrared and Optics
Division

FCP:RRL:njm